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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,661	11/03/2000	Kazuto Okazaki	4296-123	6250

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EXAMINER

NECKEL, ALEXA DOROSHENK

ART UNIT PAPER NUMBER

1764

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/705,661

Applicant(s)

OKAZAKI ET AL.

Examiner

Alexa D. Neckel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8, 9 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8, 9 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2005 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 8-9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (as shown in Fig. 1 of instant specification and as described on P1/L15-P5/L29) in view of Oswalt et al. (USP 4,769,998).

Regarding claims 8-9, Admitted Prior Art discloses similar apparatus for production of acrylic acid or acrolein comprising:

- a catalytic gas phase oxidation reactor (4);
- an evaporator (3) for gasifying liquefied propylene and/or propane (14);
- means (24) for supplying a coolant (17) to said evaporator (3);
- means (3) for chilling the coolant (17) in the evaporator (3) by recovering latent heat of the liquefied propylene and/or propane (14) (P3/L19-25);
- means for subjecting resultant gasified propylene and/or propane to said catalytic gas phase oxidation reactor (4) thereby preparing a gas containing acrylic acid or acrolein (Fig. 1);
- wherein said means (3) chilling the coolant (17) includes means (24) for adjusting the temperature of said coolant (17) or means for adjusting a flow amount thereof (Fig. 1); and
- means for adjusting pressure of the evaporator (24).

Regarding limitations recited in claim 8 which are directed to a manner of operating disclosed apparatus (such as recited specific pressure range), neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP 2114 and 2115. Further, process limitations (such as recited specific pressure range), do not have patentable weight in an apparatus claim. See *Ex Parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said apparatus comprises various heat exchangers which use a liquid coolant (Fig. 1 and P2/L24- P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler (9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a condenser (11) attached to the acrylic acid refining column (7). The reference does not explicitly disclose that said chilled coolant can be used in said heat exchangers in the apparatus and later re- circulated back to the evaporator.

Oswalt et al. teaches that it is known to prepare a process coolant, which can be used as a coolant in heat exchangers in various processes (C1/L9-19), by passing a liquid coolant through an evaporator (6). Chilled coolant from said evaporator (6) is used

in various processes and spent process coolant is being re-circulated back to the evaporator (6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a liquid coolant in the evaporator of Admitted Prior Art to prepare a chilled coolant and to use said chilled coolant in the heat exchangers in the apparatus for production of acrylic acid or acrolein, as taught by Oswalt et al., for the purpose improving operation efficiency. Said modification would merely amount to using an available coolant rather than a coolant which has to be prepared in auxiliary process, therefore saving an operation cost of said auxiliary process.

While the references disclose that said coolant can be used to control temperature of various processes, including chemical reactions (Oswalt et al. C1/L9-19 and C6/L63-32), the references do not explicitly disclose any specific temperatures for liquid coolant before or after said coolant is passed through the evaporator. As the temperature at which chemical reactions are being conducted is a variable that can be modified, among others, by adjusting the temperature of coolant used to remove heat from said chemical reactions, with said reactions temperature decreasing as the temperature of the coolant is decreased, the precise temperature of the coolant (at any point of the process) would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed coolant temperatures cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the coolant temperatures at various

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process stages in the apparatus of Admitted Prior Art in view of Oswalt et al. to maintain the desired temperature of chemical reaction conducted in said apparatus (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claim 14, Admitted Prior Art discloses similar apparatus for production of acrylic acid or acrolein comprising:

a catalytic gas phase oxidation reactor (4);

an evaporator (3) for gasifying liquefied propylene and/or propane (14);

means (24) for supplying a coolant (17) to said evaporator (3);

means (3) for chilling the coolant (17) in the evaporator (3) by recovering latent heat of the liquefied propylene and/or propane (14) (P3/L19-25);

wherein said means (3) chilling the coolant (17) includes means (24) for adjusting the temperature of said coolant (17) or means for adjusting a flow amount thereof (Fig. 1); and

means (4) for subjecting resultant gasified propylene and/or propane to a catalytic gas phase oxidation reaction thereby preparing a gas containing acrylic acid or acrolein (Fig. 1).

Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said apparatus comprises various heat exchangers which use a liquid coolant (Fig.

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1 and P2/L24- P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler (9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a condenser (11) attached to the acrylic acid refining column (7). The reference does not explicitly disclose that said chilled coolant can be used in said heat exchangers in the apparatus and later re-circulated back to the evaporator.

With respect to Oswald et al., the same comments apply as set forth above.

Response to Arguments

Drawings

The drawings were received on August 10, 2005. These drawings are acceptable.

Specification

The objection the disclosure is withdrawn due to applicant's amendments to the specification.

35 USC 103

In response to applicant's argument that Oswald et al. is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Oswald et al. is concerned with the preparation of a process coolant and the

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coolants ability to be used in other heat exchange processes while the admitted prior art also deals with a coolant as well as other heat exchange processes.

Applicant again argues that the disclosure of Oswald et al. does not teach an evaporator for gasifying liquefied propylene and/or propane as raw material of acrylic acid or acrolein. This is not The applicant argues that the disclosure of Oswald et al. does not teach an evaporator for found persuasive. The Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said apparatus comprises various heat exchangers which use a liquid coolant (Fig. 1 and P2/L24- P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler (9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a condenser (11) attached to the acrylic acid refining column (7). Oswald et al. teaches that it is known to prepare a process coolant, which can be used as a coolant in heat exchangers in various processes (C1/L9-19), by passing a liquid coolant through an evaporator (6). Chilled coolant from said evaporator (6) is used in various processes and spent process coolant is being re-circulated. back to the evaporator (6). It would have been obvious to one of ordinary skill in the' art at the time the invention was made to use a liquid coolant in the evaporator of Admitted Prior Art to prepare a chilled coolant and to use said chilled coolant in the heat exchangers in the apparatus for production of acrylic acid or acrolein, as taught by Oswald et al., for the purpose improving operation efficiency. Said modification would merely amount to using an available coolant rather than a coolant which has to be prepared in auxiliary process,

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therefore saving an operation cost of said auxiliary process. One of ordinary skill in the art would recognize that a chilled coolant can be used in various heat exchangers, without changing the principles of operation of the main process which involves said heat exchangers, and therefore, when looking for modification to heat exchangers, to either save operation cost or improve operation efficiency, one of ordinary skill in the art would utilize teachings regarding said heat exchange operation which can be found in various applications, and not just in one specific application, such as production of acrylic acid or acrolein.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation for using the chilled coolant from evaporator of Admitted Prior Art as a cooling liquid in other heat exchangers in the process of Admitted Prior Art would be simple understanding of economics. One of ordinary skill in the art at the time of the invention knew that a process coolant, which can be used as a coolant in heat exchangers in various processes, can be prepared by passing a liquid coolant through an evaporator, chilled coolant from said evaporator can be used in various processes and spent process coolant can be re-circulated back to the evaporator (as evidenced by Oswalt et

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al.). In view of this knowledge one of ordinary skill in the art would realize that operation costs can be saved if a cooling capacity already present in the process is used (by using a chilled coolant prepared in the evaporator) rather than by using an additional coolant prepared by auxiliary processes. To use a chilled coolant from the evaporator in the heat exchangers of the process of the Admitted Prior Art, as taught by Oswalt et al., would amount to nothing more than a use of a known material for its intended use in a known environment to accomplish entirely expected result. Further the examiner notes that while there must be some suggestion or motivation for one of ordinary skill in the art to combine the teachings of references to arrive at the claimed invention, it is not necessary that such be found within the four corners of the references themselves; a conclusion of obviousness may be made from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference. See *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969). Further, in any obviousness assessment, skill is presumed on the part of the artisan, rather than the lack thereof *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa D. Neckel whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alexa D. Neckel
Primary Examiner
Art Unit 1764

January 18, 2006


ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER